

measuring a parameter of the loop; and  
analyzing the parameter to provide a diagnostic output.

112  
Cut  
<sup>29</sup>  
~~27~~. (New) The method of claim <sup>28</sup>~~26~~ wherein analyzing the parameter includes performing a neural network analysis on the measured parameter.

<sup>30</sup>  
~~28~~. (New) The method of claim <sup>29</sup>~~27~~, wherein analyzing the parameter further includes performing fuzzy logic upon the measured parameter.

<sup>31</sup>  
~~29~~. (New) The method of claim <sup>28</sup>~~26~~, wherein analyzing the parameter includes performing fuzzy logic upon the measured parameter to provide the diagnostic output.

<sup>32</sup>  
~~30~~. (New) The method of claim <sup>28</sup>~~26~~, wherein operably coupling diagnostic circuitry to the loop includes operably coupling the diagnostic circuitry to the loop via a loop communicator to allow the diagnostic circuitry to access data communicated by the loop communicator.

<sup>33</sup>  
~~31~~. (New) The method of claim <sup>28</sup>~~26~~ wherein analyzing the parameter to provide a diagnostic output further comprises applying a least squares method analysis to the measured parameter.

---